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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,869	02/24/2004	Kiichi Ueyanagi	118826	8296

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EXAMINER	
LEUNG, WAI LUN	
ART UNIT	**PAPER NUMBER**
2613	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/784,869	UEYANAGI ET AL.	
	Examiner	Art Unit	
	Danny Wai Lun Leung	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45 and 47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45 and 47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-6, 14-16, 23-25, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as* ***Euw***, in view of **Dye** *(US4330204).*

Regarding to claims 1-3, **Euw** discloses a wireless optical system *(fig 10)* which comprises a transmitting section *(552, fig 10)* having a light-emitting element *(560, fig 10)* and a transmission light condenser lens *(566, fig 10)*, and a receiving section *(554, fig 10)* having a light-detecting element *(562, fig 10)* and a received light condenser lens *(566, fig 10)*, and which communicates with a counterpart device *(fig 10)*, the wireless optical system further comprising: scanning means which scans said light-emitting element, and scans said light-detecting element *(fig 9; col 5, ln 40- col 6, ln 53)*; and control means *(582, fig 10)* which controls a transmission direction of transmission light transmitted from said light-emitting element by driving said scanning means, and controls a reception direction of received light received by said light-detecting element by driving said scanning means *(col 8, ln 9-43).*

Euw does not disclose expressly wherein said scanning scans said light-emitting element relative to said transmission light condenser lens, or said scans said light detecting element relative to said received light condenser lens. **Dye**, from the same field of endeavor, teaches a wireless optical system *(fig 1)* having scan a light-emitting element relative to its transmission light condenser lens *(col 5, ln 17-54)*, and scans a light detecting element relative to said received light condenser lens *(fig 6a, 114)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to implement **Euw's** scanning method such that it scans said light-emitting element relative to said transmission light condenser lens, and said scans said light detecting element relative to said received light condenser lens as suggested by **Dye**. The motivation for doing so would have been to enhance alignment accuracy *(col 2, ln 63-col 3, ln 12)* .

As to claims 32-33, **Euw** further teaches wherein said control means also controls a directional angle of the transmission light by means of driving said scanning means *(col 6, ln 38-53)*.

As to claims 34-35, **Euw** further teaches wherein said control means also controls a directional angle of the received light by means of driving said scanning means *(col 6, ln 38-53)*.

As to claims 4-6, **Euw** further teaches said scanning means two-dimensionally scans said light-emitting element and two-dimensionally scans said light-detecting element *(col 8, ln 32-35)*.

As to claims 14-16, **Euw** further teaches wherein said light-detecting element is disposed in a vicinity of a focal point of said received light condenser lens, and is configured from a single

light detecting element which is equal in size to a diameter of a light-condensed spot formed by said received light condenser lens *(col 9, ln 41-48)*.

As to claims 23-25, **Euw** further teaches wherein said scanning means periodically wobbles a position of said single light detecting element *(col 6, ln 54-62)*; and said control means generates a positional error signal pertaining to a transmission direction of a counterpart device by detecting a received light in synchronization with a wobbling cycle of said single light detecting element *(col 6, ln 63-col 7, ln 18)*, and optimizes transmission and reception directions based on the positional error signal *(col 7, ln 19-40)*.

As to claims 32-33, **Dye** further teaches wherein said control means also controls a directional angle of the transmission light by driving said scanning means *(col 4, ln 30-54)*.

As to claims 34-35, **Dye** further teaches wherein said control means also controls a directional angle of the received light by means of driving said scanning means *(col 4, ln 30-54)*.

As to claims 4-6, **Dye** further teaches said scanning means two-dimensionally scans said light-emitting element and two-dimensionally scans said light-detecting element *(col 4, ln 54-col 5, ln 16)*.

As to claims 14-16, **Dye** further teaches wherein said light-detecting element is disposed in a vicinity of a focal point of said received light condenser lens, and is configured from a single light detecting element which is equal in size to a diameter of a light-condensed spot formed by said received light condenser lens *(fig 6a)*.

4. Claims 26, 30, 31, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Goodwill** *(US006775480B1)* in view of **Dye** *(US4330204)*.

Regarding claims 26 and 45, **Goodwill** discloses an optical wireless system which communicates between a master device and a slave device, wherein said master device and said slave device respectively comprise a transmitting section having a light-emitting element and a transmission light condenser lens, and a receiving section having a light-detecting element and a received-light condenser lens *(col 12, ln 10-63; fig 7)*, and at least one of said master device and said slave device comprises: scanning means which two-dimensionally scans said light-emitting element, and two-dimensionally scans said light-detecting element *(col 3, ln 50-63)*; measuring means which measures a direction of a received light transmitted from said master device or said slave device *(col 10, ln 41-61)*; and control means which drives said scanning means to control a direction of a received light transmitted from said light-emitting element and a reception direction of the received light received by said light-detecting element based on measurement result of said measuring means *(col 10, ln 50-61)*.

Goodwill does not disclose expressly wherein said scanning scans said light-emitting element relative to said transmission light condenser lens, or said scans said light detecting element relative to said received light condenser lens. **Dye**, from the same field of endeavor, teaches a wireless optical system *(fig 1)* having scan a light-emitting element relative to its transmission light condenser lens *(col 5, ln 17-54)*, and scans a light detecting element relative to said received light condenser lens *(fig 6a, 114)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to implement **Goodwill's** scanning method such that it scans said light-emitting element relative to said transmission light condenser lens, and said scans said light detecting element relative to said received light condenser lens as

suggested by **Dye**. The motivation for doing so would have been to enhance alignment accuracy *(col 2, ln 63-col 3, ln 12)* .

As to claim 30, **Goodwill** further teaches wherein at least one of said master device and said slave device detects a direction of the received light emitted from said master device or said slave device, and communicates by transmitting the transmission light in the direction of the received light *(fig 7; col 11, ln 41-col 12, ln 63)*.

As to claim 31, **Goodwill** further teaches wherein said slave device two-dimensionally scans said light-emitting element, and said master device measures a direction of a received light and communicates by transmitting a transmission light in the direction *(col 11, ln 25-40)*.

5. Claims 7-9, and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as **Euw***, in view of **Dye** *(US4330204), as applied to claims 1-6 above,* and further in view of **Graves et al.** *(US006721510B2)*.

Regarding claims 7-9, and 36-38, the combination of **Euw and Dye** discloses the optical system in accordance to claims 1-6 as discussed above. **It** does not disclose expressly wherein one common condenser lens is used as both said transmission light condenser lens and said received light condenser lens, and said light-emitting element and said light-detecting element are disposed such that the transmission light transmitted from said light-emitting element and the received light received by said light-detecting element are transmitted and received through said common condenser lens.

Graves, from the same field of endeavor, teaches wherein one common condenser lens is used as both a transmission light condenser lens and a received light condenser lens, and said light-emitting element and said light-detecting element are disposed such that the transmission light transmitted from said light-emitting element and the received light received by said light-detecting element are transmitted and received through said common condenser lens *(col 4, ln 8-16; fig 4)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use one common condenser lens as both said transmission light condenser lens and a received light condenser lens onto the combination of **Euw and Dye**'s system as suggested by **Graves**. The motivation for doing so would have been to save space and cost *(Graves, col 4, ln 13)*.

6. Claims 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as **Euw***, in view of **Dye** *(US4330204) as applied to claims 1-3 above, and further* in view of **Javitt et al.** *(US006381055B1)*.

Regarding claims 39-42, the combination of **Euw and Dye** discloses the system in accordance to claims 1-3 as discussed above. **Euw** further teaches wherein said light-emitting element and light-detecting element are disposed in a vicinity of a position of a focal point of said transmission light condenser lens *(col 9, ln 41-54)*. The combination of **Euw and Dye** does not disclose expressly said scanning means supports said light-emitting element and light-detecting element in a three-dimensionally movable manner, and said control means controls a transmission direction and a directional angle of the transmission light, by means of driving said scanning means to three-dimensionally move said light-emitting element and light-detecting element. **Javitt**, from the same field of endeavor, teaches a scanning means supports a light-

emitting element/ light-detecting element in a three-dimensionally movable manner, and a control means to control a transmission direction and a directional angle of the transmission light, by driving said scanning means to three-dimensionally move said light-emitting element/ light-detecting element *(col 10, ln 43-60)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to control the combination of **Euw and Dye's** light-emitting element and light-detecting element in a three-dimensionally movable manner as suggested by **Javitt**, and having a control means such as that of **Javitt's** to control a transmission direction and a directional angle of the transmission light, by driving said scanning means to three-dimensionally move said light-emitting element and light-detecting element. The motivation for doing so would have been to provide a more accurate alignment.

7. Claims 10, 11, 43, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as **Euw***, in view of **Dye** *(US4330204), as applied to claims 2, 3, 5, and 6 above, and further* in view of **Goodwill** *(US006775480B1)*.

Regarding claims 10, 11, 43, and 44, the combination of **Euw and Dye** discloses the optical system in accordance to claims 2, 3, 5, and 6 as discussed above. **It** does not disclose expressly wherein said light-detecting element includes a plurality of light-detecting cells arranged in a two-dimensional array, and said control means drives said scanning means to limit said light-detecting cells to four or less number of cells which receive light among the plurality of light-detecting cells. **Goodwill**, from the same field of endeavor, teaches wherein said light-detecting element includes a plurality of light-detecting cells arranged in a two-dimensional

array, and said control means drives said scanning means to limit said light-detecting cells to four or less number of cells which receive light among the plurality of light-detecting cells *(col 3, ln 51-63)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to arrange a plurality of light-detecting cells in a two-dimensional array onto the combination of **Euw and Dye**'s system as suggested by **Goodwill**. The motivation for doing so would have been to be able to sufficiently accommodate the number of data channels being transmitted *(Goodwill, col 4, ln 47-56)*.

As to claim 12, **Euw** further teaches wherein the plurality of light-detecting cells are configured from a plurality of CCDs or MOS elements *(col 7, ln 46-48)*.

As to claim 13, **Euw** further teaches wherein the plurality of light-detecting cells are configured from a plurality of photodiodes or avalanche photodiodes *(col 7, ln 46-48)*.

Claims 17-19 are rejected for the same reasons as stated above regarding claims 10, 11, 43, and 44, because in addition to the limitations as stated above, **Euw further** teaches wherein said light-detecting element is disposed in a vicinity of a focal point of said received light condenser lens, and is constituted from light detecting elements which are equal in size to a diameter of a light-condensed spot formed by said received light condenser lens *(col 9, ln 41-54)*. It would have been obvious to combine **Euw, Dye,** and **Goodwill** for the same reason as stated regarding claims 10, 11, 43, and 44, such that said light-detecting element is constituted from a pair of light detecting elements as suggested by **Goodwill**.

8. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as **Euw***, in view of **Dye** *(US4330204), as applied to claims 1-6 above, and further* in view of **Mun** *(US005663944A)*.

Regarding claims 20-22, the combination of **Euw and Dye** discloses the optical system in accordance to claims 1-6 as stated above. **It** does not disclose expressly wherein said light-emitting element is formed over said light-detecting element. **Mun**, from the same field of endeavor, teaches a light-emitting element is formed over a light-detecting element *(fig 4; col 3, ln 24-50)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to form a light-emitting element stacked on a light-detecting element onto the combination of **Euw and Dye**'s system as suggested by **Mun**. The motivation for doing so would have been to reduce space and cost.

9. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Goodwill** *(US006775480B1)*, in view of **Dye** *(US4330204), as applied to claim 45 above, and further* in view of **Andreu-von Euw et al.** *(US007120363B2) hereafter refer to as **Euw**.*

Regarding claim 47, the combination of **Goodwill and Dye** teaches the optical wireless system which communicates between a master device and a slave device as discussed above regarding claim 45, **it** does not disclose expressly wherein said transmitting section of at least one of said master device and said slave device transmits transmission light having a first directional angle, and said receiving section of the at least one of said master device and said slave device receives the transmission light having the first directional angle, and starts a communication with said transmitting section, and wherein, subsequently, said transmitting section or said receiving section performs the communication using a narrower directional angle of the transmission light or the received light than the first directional angle. **Euw**, from the same field of endeavor, teaches an optical wireless system wherein a transmitting section of a transmission device transmits transmission light having a wide directional angle *(col 6, ln 38-*

44), and said receiving section of a remaining device receives the transmission light having a wide directional angle, and starts a communication with said transmitting section, and wherein, subsequently, said transmitting section or said receiving section performs the communication by means of narrowing a directional angle of the transmission light or the received light *(col 6, ln 43-53)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to utilize a wide directional angle and a narrow directional angle onto the combination of **Goodwill and Dye**'s system based on different circumstances as suggested by **Euw**. The motivation for doing so would have been to appropriately allocate power consumption while maintaining alignment accuracy.

10. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Goodwill** *(US006775480B1)*, in view of **Dye** *(US4330204), as applied to claim 26 above, and further* in view of **Javitt et al.** *(US006381055B1)*.

Regarding claim 27, **the combination of Goodwill and Dye** discloses the system in accordance to claim 26 as discussed above. **It** does not disclose expressly wherein said light-emitting element of said master device and said slave device emit the transmission light at different wavelengths. **Javitt**, from the same field of endeavor, teaches a wireless optical system having light-emitting element of said master device and said slave device emit the transmission light at different wavelengths *(col 8, ln 11-29)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use different wavelengths for emitting elements for the master device and slave device onto the combination of **Goodwill and Dye**'s system as suggested by **Javitt**. The motivation for doing so would have been to avoid interference.

As to claims 28 and 29, **Javitt** further teaches wherein the wavelength of the beam is preferably between 0.7 μm and 1.5 μm. Therefore, absent any teaching of criticality, it would have been an engineering design choice to implement a shorter wavelength for the slave device then that of the transmission light emitted from said light-emitting element of said master device; or wherein said light-emitting element of said master device emits the transmission light having a wavelength of 1.4 to 1.6 μm, and said light-emitting element of said slave device emits the transmission light having a wavelength of 0.8 to 1 μm. The motivation would have been to optimize transmission quality using different design choice criteria. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; Minnesota Mining and Mfg. Co. v. Coe, 69 App. D.C. 217, 99 F.2d 986, 38 USPQ 213; Allen et al. v. Coe, 77 App. D.C. 324, 135 F.2d 11, 57 USPQ 136.

Response to Arguments

11. Applicant's arguments with respect to claims 1-45, and 47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-9:00pm Mon-Thur.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL
July 30, 2007

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